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had Dr. DOMIN had a longer experience with our ferns, and observed the great diversity of their form and growth, he would have realized that some of his new kinds were but growths of well known species."

Nearly 70 years of experience with plants in the field, much of it with Queensland plants, add to the weight of BAILEY'S comments. At the time of DOMIN'S visit, the present reviewer was collecting morphological material in Queensland, and can heartily agree with the remarks regarding the variability of *Psilotum*, *Marattia*, and *Platycerium*. In *Platycerium*, particularly, the appearance of the plant is so affected by its position on the tree, that isolated plants might be described as new species, if the differences were not so obviously due, in some cases, to merely mechanical causes.—C. J. CHAMBERLAIN.

A new seed genus.—Miss BENSON[20] has made *Conostoma ovale* Williamson the basis of a new form genus, which she calls *Sphaerostoma*. Along with *C. ovale* the doubtful species *C. intermedium* is included as *S. ovale*. In general structure the seed resembles *Lagenostoma*, and is found most frequently without its cupule (or outer integument), from which it doubtless separated when dropped. All of the epidermal cells of the integument are papillate, and at the apex, where the integument is free from the nucellus, they become so elongated as to form a whorl of epidermal crests, the "canopy" being 8-lobed. These crests Miss BENSON calls "frills."

The structure of the lagenostome, however, is quite peculiar. There is the usual central column of nucellar tissue, surrounded by the moatlike pollen chamber which is invested by the epidermis of the nucellus. But the roof of the pollen chamber is modified into what Miss BENSON regards as "an elastically acting mechanism" which definitely closes the pollen chamber after there has been a dehiscence which admits the pollen grains. This elastic mechanism, forming the roof of the pollen chamber, is the epidermis so modified as to resemble in appearance a multiseriate annulus. The conclusion is that in dehiscence this mechanism straightens elastically, admits pollen grains, and then closes the chamber again.

The seeds are provisionally referred to *Heterangium Grievii* on what seems to be excellent evidence, namely constant association, suggestions of actual continuity of ovules with the parent plant, and the evident morphological relationship to *Lagenostoma*.—J. M. C.

Culture of Opuntia.—GRIFFITHS[21] records some very interesting observations upon the behavior of certain species of *Opuntia* under culture. The plants were grown at the government stations at Brownsville and San Antonio,

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[20] BENSON, MARGARET J., *Sphaerostoma ovale* (*Conostoma ovale* et *intermedium* Williamson), a Lower Carboniferous ovule from Pettycur, Fifeshire, Scotland. Trans. Roy. Soc. Edinburgh **50**:1–15. *figs. 3. pls. 1, 2.* 1914.

[21] GRIFFITHS, D., Behavior, under cultural conditions, of species of Cacti known as *Opuntia*. U.S. Dept. Agr., Bur. Pl. Ind., Bull. no. 31. pp. 24. *pls. 1–8. fig. 1.* 1913.

Texas, and Chico, California. At each of these places between 600 and 1500 varieties of *Opuntia* were under cultivation. The general purpose of the investigations was economic, but incidentally the behavior of these plants was very suggestive. Spiny plants grown near the coast of Texas mature spines much more slowly than in drier regions. Changes in the environment seem to have more effect on the production of spicules (bristles) than of spines, the evidence indicating that conditions unfavorable to vegetative production stimulate the growth of spicules. An interesting contrast between the conditions in Southern Texas and California is shown by the fact that the former region is favorable for the production of vegetative growth, while California is better adapted to fruit production. It was found that many species are not promising for breeding purposes because of lack of variability; they are very constantly spiny, and spine protection seems to be directly proportional to plant vigor. The power of recovery from the effect of low temperature is remarkable, especially when the succulency of the plant is considered. A very interesting observation was that in many of the species, especially the larger ones, the plants grown from cuttings and those grown from seeds are very different in appearance; the latter are tree-like and the former are headed on the ground without distinct stems.—J. M. C.

Mitosis in Conjugatae.—In agreement with the earlier work of LUTMAN, VAN WISSELINGH[22] finds that the nuclei of *Closterium* show at all stages an essential correspondence with those of higher plants. Division is strictly mitotic, and the chromosomes, more than 60 in number and of various lengths, all come directly from the reticulum, which is composed of but one material. They are not placed in a ring around a central spindle at metaphase, as LAUTERBORN thought, but form a uniform plate of the usual type. VAN WISSELINGH denies the presence of a continuous spirem at prophase and telophase as reported by LUTMAN. The nucleolus is not of the peculiar kind previously described for *Spirogyra;* in *C. Ehrenbergii* it is really an agglomeration of many small nucleoli. No centrosomes were found.

In *Eunotia*,[23] also, the nucleus divides mitotically, as in other diatoms, but well developed chromosomes are not formed. The nuclear reticulum gives rise to small irregular bodies which become arranged in the form of a "nuclear plate" around the characteristic "central spindle" of the diatoms. The nuclear plate divides to form two daughter plates. VAN WISSELINGH's results here agree with those of KLEBAHN and KARSTEN on other diatoms, but not with those of LAUTERBORN, who found in several species long and well developed chromosomes in both mother and daughter nuclei.

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[22] VAN WISSELINGH, C., Über die Kernstruktur und Kernteilung bei *Closterium*. Siebenter Beitrag zur Kenntnis der Karyokinese. Beih. Bot. Centralbl. **29**^{1}:409–432. *pl. 10.* 1913.

[23] VAN WISSELINGH, C., Die Kernteilung bei *Eunotia major* Rabenh. Achter Beitrag zur Kenntnis der Karyokinese. Flora **105**:265–274. *pl. 10.* 1913.